Thank you for the providing the opportunity to voice my concerns in the rulemaking process. I am writing this letter to express my support for Title II classification of ISPs, especially network neutrality rules, and will address some questions raised by NPRM.

For work and personal use, I rely on the Internet. Professionally, I can begin working at home using a residential ISP. I can continue working during my commute because of my mobile ISP. And at the office, I continue working using our corporate ISP. To me, an ISP is merely a conduit between myself and a businesses that generates, acquires, stores, transforms, processes, and retrieves information. An ISP is not, itself, an “information service”, as I will explain later.

Personally, I use my ISP to connect with friends and family using a variety of messaging platforms and Internet calling. Internet calling is a great example of how Title II benefits consumers and supports innovation. Today, I am able to talk with relatives an ocean away using just my Internet connection without fear that the incumbent voice provider will artificially degrade call quality. It was not always so cheap or easy to call out-of-state. Ten years ago, I remember my wife and I hunting for good deals on calling cards and then counting the minutes remaining on them.

Internet calls are a wonderful advance in communications technology, one that benefits consumers tremendously due to their low cost and high quality. But while their consumers benefitted, Internet service providers that are also voice service providers lost revenue. Some companies, like Madison River Communication of North Carolina, chose to sabotage Internet calling on its network.[1] Similarly, AT&T forced Apple to disable Skype Internet calls over its mobile network.[2] As an investor, I understand a business’s drive to maximize revenue. In this light, Madison River Communication and AT&T’s actions can be explained. But as a consumer, I do not believe their behavior should be excused.

By and large, ISPs have historically behaved, even before 2015, as if they had always operated under network neutrality, enabling the vibrant Internet landscape we currently enjoy. But as is their wont, businesses are constantly experimenting with ways to extract more money from their customers. Madison River Communication and AT&T are only the first two examples in this letter of why we should not rely on the goodwill of oligarchical businesses to create the conditions that serve our national interest. ISPs should be prohibited from suppressing innovation by erecting toll gates, sabotaging, or interfering in any other way. Title II classification provides this prohibition.

Can the market address such consumer abuses without Title II? Competition between ISPs and consumer choice is often touted as a solution. I happen to live in an affluent area that is served by two high-speed ISPs. Much of the country is less fortunate, however. The problem is that

---

[1] http://news.cnet.com/Telco-agrees-to-stop-blocking-VoIP-calls/2100-7352_3-5598633.html

[2] http://fortune.com/2009/04/03/group-asks-fcc-to-probe-iphone-skype-restrictions/

starting an ISP is really hard.[3] While any consumer can switch from hotmail to gmail, uber to Lyft, Evernote to OneNote with just a few keystrokes, consumers living in an area with only one high-speed ISP have no choice and are completely captive. In addition to network neutrality protections, Title II provides protection against privacy invasions, fraudulent billing, and price gouging. These are all useful tools for individual consumers to wield against a well-heeled ISP most concerned with profit.

This is my general statement regarding Title II. I will now address specific paragraphs of the NPRM.

Paragraph 27 asks:

> *[H]ow the Commission should assess whether a broadband provider is "offering" a capability. Should we assess this from the perspective of the user, from the provider, or through some other lens?"*

I believe the user's perspective is appropriate since, without customers, ISPs would have no reason to exist.

The NPRM posits that, because an ISP is involved in making a blog post, reading news, searching, uploading pictures, and creating grocery lists, an ISP provides the "capability for generating, acquiring,storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications." By such a low standard, the power company also offers the same capability since, electricity, too, is required to perform these actions.

Let's consider these capabilities from the user's perspective. If all the photo sharing services ceased operation, is a user with an Internet connection capable of sharing photos? No. If all the search engines ceased operation, is a user with an Internet connection capable of performing searches? No. If all software on consumers' computers and on all servers were deleted, would a user with an Internet connection be capable doing anything useful with that connection? No.

An Internet connection, in and of itself, provides no capabilities. An internet connection is a *means* to an end but is not, itself, an end. Photo sharing is a end. Search is an end. VoIP is an end. The software powering these ends provides the capability. An Internet connection merely provides access; it's plumbing.

Claiming an ISP provides the "capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information" is a disservice to all the engineers, project managers, and many others who actually implement the capability. From the

---

[3] https://arstechnica.com/business/2014/04/one-big-reason-we-lack-internet-competition-starting-an-isp-is-really-hard/

user's perspective, all the capability exists at the *ends* of the network, not within the network, itself.[4]

Paragraph 29 attempts to use dns and ip routing to distinguish Internet service from Title II services, such as mobile voice services (commercial mobile radio services), but the rationale is flawed.

The paragraph cites dns domain name resolution as proof that users expect more than mere data transmission from their ISPs. In a mobile voice call, however, the exact same process occurs. When users dial a phone number, they do so without knowing which device will actually receive the call. Just as domain names are a logical rather than absolute identifier, so, too, are phone numbers. The mobile voice system maps phone numbers to devices to connect calls to the expected person. This mapping can change minute to minute, as I observed when porting my phone number to a different mobile voice provider. Shortly after submitting the port request, I observed calls to my phone number ringing on my new device. Phone numbers are for mobile phones what domain names are for Internet servers.

Furthermore, the ISP is *not* the party providing dns services. On my website, I specify the ip addresses mapped to my domain names. Then the dns servers of my registrar dole out ip addresses for my domains.

In fact, dns servers are not the exclusive purview of ISPs. There are several dns servers available for public use. The fact that ISPs happen to offer one, as well, is not remarkable at all. ISPs could disable their dns servers and the Internet would get along fine.

The paragraph also emphasizes how a user is generally unaware of the physical location of Internet servers. Users of mobile voice services also are unaware of the physical locations of call recipients. A Los Angeles area code phone number, for example, can be mapped to a device currently located in Europe.

Paragraph 30 writes:

> *Internet service providers routinely change the form or content of the information sent over their networks—for example, by using firewalls to block harmful content or using protocol processing to interweave IPv4 networks with IPv6 networks.*

The NPRM cites a firewall and low-level networking protocols as changes to form or content. I will address each, in turn.

NPRM conflates the "change in the form or content" of data and the receipt of data. A firewall does not change form or content. It only permits or denies passage. It does *not* create a

[4] http://www.worldofends.com/#BM5

derivative work out of any data that pass through it. In other words, the data sent and the data received are identical when the firewall permits passage. And in the case where it does not, the recipient receives no data at all (but may receive metadata like an error message). I submit that the absence of data does not qualify as a "change in the form or content."

The NPRM cites ip4 network and ip6 network interoperability as a "change in the form or content." The NPRM does not, however, offer an important fact: there is no other way for packet-based networks, such as Internet Protocol (ip) networks, can function. If the the usage of industry standards count as "chang[ing] the form or content", then Telecommunications service providers also "change the form or content," which is an oxymoron.

From the consumer's perspective, the use of industry standard networking protocols, in general and not just in the case of ip4 + ip6 interoperation, should not be construed as a "change in the form or content." The fact that, for example, a large picture is divided into many data packets that are reconstituted into the original image does not qualify as a "change in the form or content." That is how packet-based networking protocols work. To the consumer, the picture sent is *exactly* the picture received, which is a hallmark of "Telecommunications." The mechanism of how this happened is immaterial.

So what does it look like when an ISP actually makes a "change in the form or content?"

- In 2010, Windstream intercepted Google searches from the Firefox toolbar and redirected them to a search service that financially benefited Windstream.[5]
- In 2013, CMA Communications altered html by injecting ads. H&R Block ads, for example, were added to the apple.com web site without Apple's knowledge.[6]

Neither of these changes to the content of the html are beneficial to consumers. I would characterize them as consumer-hostile since they misrepresent the parties sending data. Consumers requesting data from Google should get data from Google. Consumers requesting data from Apple expect to receive what Apple actually sent them.

Paragraph 31 claims that, because an "information service" provides access to the Internet, everything that provides access to the Internet is an "information service." This is a false equivalence. Section 230 reads:

> *The term "interactive computer service" means any information service, system, or access software provider that provides or enables computer access by multiple users to a computer server, including specifically a service or system that provides access to the Internet . . .*

[5] http://www.dslreports.com/shownews/Windstream-Hijacking-Firefox-Google-Toolbar-Results-107744
[6] https://arstechnica.com/tech-policy/2013/04/how-a-banner-ad-for-hs-ok/

Section 230 offers “information service” as one of *three* mechanisms “that provides access to the Internet . . .” The other two mechanisms are “system” and “access software provider”.

Using these terms, a “Telecommunications” service is a “system . . . that provides or enables computer access by multiple users to a computer server, including specifically a service or system that provides access to the Internet . . .”

Paragraph 32 writes:

> *Section 231 is even more direct. It expressly states that “Internet access service” “does not include telecommunications services.”*

I think the caveat “does not include telecommunications service” is necessary since Internet service is just one of many types of services available through “Telecommunications services.” It would be inappropriate to include non-Internet services in a section dealing with Internet restrictions.

I interpret section 231 as:

> *Such term does not include all telecommunications services but does include those that connect endpoints on the Internet.*

Paragraph 44 contends Title II classification has made ISPs reluctant to invest in their networks. Several major ISPs, however, have gone on the record at their shareholder meetings and stated that Title II classification has not not changed their investment plans.[7]

- AT&T’s CEO told investors that network neutrality and Title II constraints would have no effect on their investment plan.[8]
- Comcast’s CFO told investors their concerns about Title II classification were based on “the fear of what Title II could have meant, more than what it actually did mean”.[9] Comcast increased capital investments by 10.2% in Q1 2017.[10]

Paragraph 47 writes:

---

[7] https://arstechnica.com/information-technology/2017/05/title-ii-hasnt-hurt-network-investment-according-to-the-isps-themselves/

[8] https://seekingalpha.com/article/3741746-ts-t-ceo-randall-stephenson-presents-ubs-global-media-communications-brokers-conference?page=2

[9] https://consumermediallc.files.wordpress.com/2016/12/comcasttranscript.pdf

[10] http://www.cmcsa.com/releasedetail.cfm?ReleaseID=1023210

> *We also seek specific comment on how the classification of broadband Internet access service as a telecommunications service has impacted smaller broadband Internet access service providers*

Major ISPs do not have a perfect track record on network neutrality:

- Comcast blocked the bittorrent protocol.[11]
- MetroPCS allowed only YouTube video to transit its high speed 4G network.[12]
- AT&T ransomed iPhone FaceTime video calling behind pricier text and voice plan.[13]

But they mostly abide by network neutrality constraints and have stated on the record that Title II has not affected their investment strategies. This makes sense since any strategy that violates network neutrality for huge populations of consumers would generate a large public relations problem. So, major ISPs never planned any such strategy.

Smaller ISPs, on the other hand, have a much smaller client base. Hoping their small size would allow them to "fly under the radar", they could gamble that any negative publicity is worth the increased revenue from interfering with data in-transit. The technology to manipulate data in-transit is not cheap or easy to build but is required to nickel and dime consumers. Small ISPs that had planned to invest in such technology would find themselves unable to recoup their costs under Title II. So, when some small ISPs claim that Title II has affected their capital investments, I believe some of them are being genuine. But this is not the type of investment that helps consumers, whose interests should be at the heart of any ruling by the Commission.

Furthermore, several small ISPs have come out in favor of Title II. In a letter[14] to the Commission, they wrote:

> *We have encountered no new additional barriers to investment or deployment as a result of the 2015 decision to reclassify broadband as a telecommunications service and have long supported network neutrality as a core principle for the deployment of networks for the American public to access the Internet.*

Thank you for the opportunity to voice my concerns and thoughts.

Sincerely,

---

[11] https://arstechnica.com/tech-policy/2009/12/comcast-throws-16-million-at-p2p-throttling-settlement/
[12] http://www.wired.com/2011/01/metropcs-net-neutrality-challenge/
[13] http://www.freepress.net/press-release/99480/att-blocking-iphones-facetime-app-would-harm-consumers-and-break-net-neutrality
[14] https://www.eff.org/files/2017/06/27/isp_letter_to_fcc_on_nn_privacy_title_ii.pdf

David Ha